DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
NEW YORK STATE DEPARTMENT OF HEALTH

OPEN-FILE REPORT 82-268
(SHEET 3 OF 5)

76°05′ 07′30″ 76°00′ 07′30″ 55′ 52′30″ 75°50′

42°10′ 07′30 42°05′

EXPLANATION FOR GEOLOGIC SECTIONS

QUATERNARY

- pm — Peat, marl, muck, and clay; postglacial bog deposits; low permeability
- las — Lake silt and fine sand; offshore deposits in proglacial or postglacial lakes; thin bedded to massive; covered by 5 to 15 feet of fine sand and silt in low lying areas; low to moderate permeability
- oa — Outwash sand and gravel commonly overlain by alluvial sand and gravel; sand and gravel is covered by 5 to 15 feet of fine sand and silt in low lying areas; high permeability
- ksg — Kame and kame terrace sand and gravel; ice-contact deposits; some sorting and secondary calcite cementation; high permeability
- mt — Morainal till; generally stony with some poorly sorted gravel deposited at edge of ice sheet; low permeability
- t — Till; glacial deposits of unstratified silt and sand, with occasional pebbles, cobbles, and boulders; thickness generally a few feet to many tens of feet; very low permeability

DEVONIAN

- r — Bedrock (undifferentiated); shale and siltstone; low to moderate permeability in fractures and joints

GEOLOGIC CONTACT--dashed where approximately located

WATER TABLE--average level. (See note on sheet 4.)

PRINCIPAL AQUIFER

WELL OR TEST HOLE--with number used by Randall, 1972, or letters (Tb) designating test holes approximately located (Section E-E')

National Geodetic Vertical Datum of 1929

Vertical exaggeration X 20

Locations of sections shown on this sheet and on sheet 1, "Surficial Geology."

NOTE

Aquifer thickness is the thickness of water-saturated sand and gravel below the water table and above the first confining unit. Thicknesses were estimated from well and test-hole-drilling data (Randall, 1972 and Randall, unpublished data in files, U.S. Geological Survey, Albany, New York). The aquifer-thickness map was constructed by fitting lines of equal thickness to well and test-hole-data points for which saturated thickness is known. The valley-fill deposits in this area are highly variable; thus in places the lines represent a generalization of complex conditions.

The upper aquifer is generally thickest near the center of the valley, although thick deposits occur at the valley margin at Nanticoke Creek west of Endicott and at the Chenango River north of Binghamton. In places, the aquifer is downwarped beneath kettleholes filled in by postglacial silt and clay generally less than 50 feet thick. Such surficial impermeable units are shown as stippled areas. Shaded areas on the maps indicate where a relatively thick buried aquifer is probably present. Generally, it is separated from the upper aquifer by a confining layer of relatively impermeable lake sediments. The elevation and extent of this confining layer are variable. The buried deeper aquifer is not present everywhere within the valley. (See section E-E'.) At some points, the confining layer is absent (see section A-A'), in which case the entire saturated section is mapped as a single aquifer.

Well Yields tend to increase with aquifer thickness, although maximum yields vary greatly and unpredictably between nearby points of identical saturated thickness due to local variation in grain size and siltiness of gravel layers. Hollyday (1969) showed that about half the properly designed wells in the Susquehanna basin of New York would produce from 0.5 to 3.5 gallons per minute per foot of drawdown per foot of saturated aquifer penetrated. Therefore, the potential yield of a well tapping surficial aquifers at any point in this area can be estimated by multiplying:

a) saturated thickness; times
b) half the saturated thickness (which is ordinarily the maximum feasible drawdown); times
c) 0.5 for the upper limit, or times 3.5 for the lower limit.

There is about a 50-percent chance that well yield will fall within these limits.

EXPLANATION

- 20 — LINE OF EQUAL THICKNESS OF AQUIFER--dashed where approximately located. Interval 20 feet
- TOTTOT — BOUNDARY OF PERMEABLE MATERIAL TOO THIN FOR PRODUCTIVE WELLS, ALTHOUGH IN HYDRAULIC CONNECTION WITH UPPER AQUIFER--ticks on dashed lines point to such areas
- LAKE SEDIMENTS AND MARSH DEPOSITS--silt, clay, and organic matter filling kettleholes, which overlie the upper aquifer
- MAJOR BURIED AQUIFER--generally more than 50 feet thick
- AQUIFER BOUNDARY--dashed where full extent of aquifer is not shown
- AREAS OF INSUFFICIENT DATA

WELL SYMBOLS

- 00685000 — COMMUNITY WATER SYSTEM WELL OR WELL FIELD--numbered by New York State Department of Health; may apply to one or more systems
- X — DATA POINT--well or test hole used to draw thickness lines
- O57-27 — WELL--on which geologic section is based with seconds of latitude-longitude from Randall (1972); b signifies a test boring
- A ——— A′ — LINE OF SECTION

REFERENCES CITED

Randall, Allen D., 1972, Records of wells and test borings in the Susquehanna River basin, New York: New York State Department of Environmental Conservation Bulletin 69, 92 p.

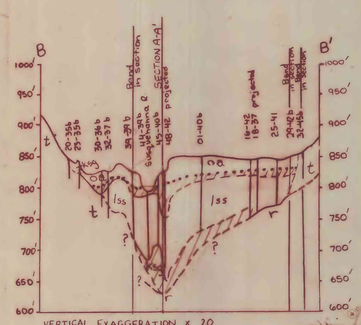
Hollyday, E. F., 1969, An appraisal of the ground-water resources of the Susquehanna River basin in New York State: U.S. Geological Survey Open-file Report, 52 p.

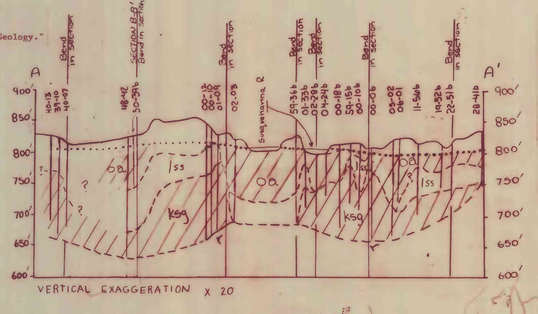
LOCATION MAP

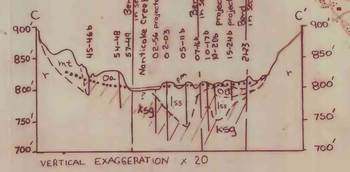
DRAINAGE AREA TO AQUIFER

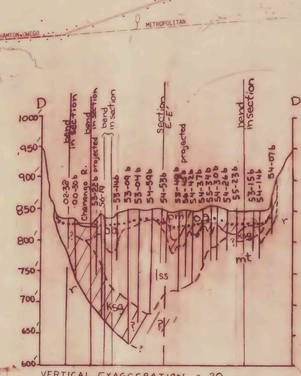
SCALE 1:24000

N









AQUIFER THICKNESS, WELL YIELDS, AND GEOLOGIC SECTIONS

By

Thomas J. Holecek and Allan D. Randall

BASE FROM NEW YORK STATE DEPARTMENT OF TRANSPORTATION BINGHAMTON EAST, N.Y., 1973; BINGHAMTON WEST, N.Y., 1973; CASTLE CREEK, N.Y., 1973; CHENANGO FORKS, N.Y., 1973; ENDICOTT, N.Y., 1973; MAINE, N.Y., 1973. 1:24,000

GEOHYDROLOGY OF THE VALLEY-FILL AQUIFER IN THE ENDICOTT-JOHNSON CITY AREA, BROOME COUNTY, NEW YORK

1982

HYDROLOGY MAPPED IN 1981